1/2   014
UNCLASSIFIED   PROCESSING DATE--09OCT70
TITLE--THEORY OF HOMOGENEOUS REACTIONS INVOLVING PROTON TRANSFER -U-

AUTHOR-(05)-LEVICH, V.G., DOGONADZE, R.R., GERMAN, E.D., KUZNETSOV, A.M.,
   KHARKATS, YU.I.
COUNTRY OF INFO--USSR

SOURCE--ELECTROCHIM. ACTA 1970, 15(2), 353-67

DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--PROTON, QUANTUM MECHANICS, CHEMICAL REACTION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1992/1849   STEP NO--UK/0000/70/015/002/0353/0367

CIRC ACCESSION NO--AP0112833
                       UNCLASSIFIED

UNCLASSIFIED

CIRC ACCESSION NO--AP0112833   PROCESSING DATE--09OCT70
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A QUANTUM MECH. THEORY FOR PROTON
TRANSFER PROCESSES IN SOLNS. IS GIVEN. THE BRONSTED RULE AND ISOTOPE
EFFECT FOR THESE PROCESSES ARE ALSO DISCUSSED.   FACILITY: INST.
ELECTROCHEM., MOSCOW, USSR.

UNCLASSIFIED   89

GERMAN, G. P., and CHERNOKHVOSTOVA, Ye. V., Moscow Institute of Epidemiology
and Microbiology

"Immunochemical Heterogeneity of Incomplete Antibodies to O-Antigen of
S. Typhi"

Abstract: Blood serum of typhoid patients, individuals vaccinated against
this disease, and chronic typhoid carriers may contain three types of incom-
plete antibodies to the O-antigen of S. typhi -- IgG, IgA, and IgM -- which
differ from each other in immunochemical properties and which also differ from
the corresponding complete antibodies in chemical and physical properties.
The IgG type of O-antibodies occurs most frequently and in the highest titers.
The IgG type antibodies are also present in the serum of vaccinated persons in
whom the synthesis of complete O-antibodies is inhibited. In chronic S. typhi
carriers, production of complete O-antibodies of the IgM type is suppressed,
while incomplete antibodies of the IgM type are present in their blood serum,
though in low titers. In mice infected with typhoid O-antigen, incomplete
IgG and IgM type O-antibodies are synthesized in the early stage of the

1/2

USSR

GERMAN, G. P., and CHERNOKHVOSTOVA, Ye. V., Zhurnal Mikrobiologii, Epidemiologii
i Immunobiologii, No 11, 1971, pp 127-131

immune response and are present in the serum prior to the appearance of
complete antibodies.

2/2

Organometallic Compounds

KOPAYEVICH, Yu. L., VELEN'KIY, G. G., MYSOV, Ye. I., GERMAN, L. S., and KNUNYANTS, I. L., Institute of Element-Organic Compounds, Academy of Sciences USSR

"Derivatives of Bis(pentafluoroethyl)arsenous Acid"

Abstract: The reaction of ethanol with $(C_2F_5)AsF$ (I) results in the formation of small amounts of the corresponding ester. In the presence of SiO_2, however, the yield of $(C_2F_5)_2AsOC_2H_5$ is significantly increased. The hydrolysis of I leads to the formation of $(C_2F_5)AsOAs(C_2H_5)_2$; and the subsequent reaction with diethylamine to $(C_2F_5)_2AsN(C_2H_5)_2$. Reaction of (I) with phenylmagnesium bromide leads to the formation of $(C_2H_5)_2AsC_6H_5$. Syntheses, elemental composition, and mass spectrometric and NMR data are given for the compounds generated.

1/1

KOPAYEVICH, YU. L., STUMBREVICHUTE, Z. A., FEDOROV, L. A., and GERMAN, L. S.

"NMR Spectra and Structure of Polyfluoroalkylarsines"

Abstract: Derivatives of bis(pentafluoroethyl)arsinous acid, of mixed tertiary arsines, derivatives of bis(α-chlorotetrafluoroethyl)arsinous acid, and tertiary arsines were studied by NMR ^{19}F spectroscopy. Spectral characteristics originating from the presence of chiral and prochiral centers in the compounds studied have been observed and discussed. The As-Hlg bonds were shown to be very labile. Inversion of the arsenic atom was shown to be slow (in the NMR time scale).

1/1

Organometallic Compounds

USSR   'UDC 542.91:547.242+546.16

KOPAYEVICH, YU. L., BELEN'KIY, G. G., GERMAN, L. S., and KNUNYANTS, I. L.,
Institute of Organoelemental Compounds, Academy of Sciences USSR

"Fluoroalkylarsenic Derivatives"

Abstract: Tertiary polyfluoroalkylarsines were synthesized by addition of AsF_3
(I) to certain fluoro-derivatives of ethylene in the presence of SbF_5 (II).
Thus, the reaction of (I) with $CH_2=CF_2$ at 100-120° under pressure for 6 hours,
in the presence of traces of (II) yielded the following: $(CH_3CH_2)_3As$, 42% yield,
b.p. 146-147°. The reaction of (I) with $CF_2=CFH$ requires 0.3 moles of (II) and
is easily executed under pressure at 20°. This produced $(CF_3CFH)_3As$ in 74%
yield and b.p. 114-115°. By the reaction of (I) with $CF_2=CF_2$ in the presence
of 0.3 moles (II) under pressure at 20°, the following products were obtained:
1) $(C_2F_5)_3As$, b.p. 87-88°, yield 39%; 2) $(CF_3CF_2)_2AsF$, yield 30%, b.p. 67-68°.
The structure of these compounds were confirmed by nuclear magnetic resonance
and mass-spectroscopic data.

1/1

SSSR

UDC 612.014.424.2

GERMER, M. Z., Latvian Scientific Research Institute of Experimental and Clinical Medicine, Ministry of Health, Latvian SSR

"Possible Mechanism of the Biological Action of an Electrostatic Field"

Riga, Izvestiya Akademii Nauk Latviyskoy SSR, No 4 (285), 1971, pp 69-72

Abstract: Due to the natural electrostatic field of the earth and the presence of ions in the air, a direct current of 130-500 V/m and of a few millionths of an ampere is continuously flowing through the air. Technological structures (housing, machinery, and so on) can considerably increase the electrostatic field, while an increasing concentration of ions in the air increases the current. A live organism, including the human body, offers very little electrical resistance, and therefore the current flows through it. Any pointed protruberance on the body surface, such as hairs, cilia, thorns, or needles, facilitates charge leakage and thus increases the current flow through the body. If, however, the body is not grounded, no current can flow through it. Since evidence suggests that the electrostatic field of the earth exerts certain effects even on an insulated live body, other mechanisms of action remain to be elucidated.
1/1

FOMINA, O. P., LEVENBERG, N. Ye., SELEZNEV, A. G., and GERMAN, S. I.;
Khar'kov Polytechnioal Institute, Karh'kov, Turbine Plant

"Mechanical Properties of the Metal in the High-Temperature Region of the
Heat-Affected Zone in 15Kh1M1FL Steel Welds"

Kiev, Avtomaticheskaya Svarka,No 11, Nov 70, pp 30-31

Abstract: A study was   made of the high-temperature region of the
heat-affected zone in 15Kh1M1FL steel   (0.19% C, 0.64% Mn,
1.7% Cr, 1.14% Mo, 0.14% V).The effects of various tempering conditions
on the structural transformations and properties of the metal of each
variant of the imitated weld-affected zone were analyzed. It was found
that the ductility of the metal in the high-temperature region of the
heat-affected zone markedly depends on the cooling rate after welding.
As applied to multipass welding conditions, the required impact toughness
may be met by tempering the weld at 740-760°C. The hardness of the high-
temperature region of the heat-affected zone in 15Kh1M1FL will not always

1/2

USSR

FOMINA, O. P., et al, Avtomaticheskaya Svarka, No 11, Nov 70, pp 30-31

correlate with the impact toughness. A decrease in the hardness after tempering even to HV 220 for a metal very slowly cooled down from 1300°C will not raise the impact toughness.

2/2

USSR

GERMAN, V. A.

"One Algorithm for Cutting of Graphs"

Ob Odnom Algoritme Rasrezaniya Grafov [English Version Above], Riga, 1972, 9 pages (Translated from Referativnyy Zhurnal Kibernetika, No 4, 1973, Abstract No 4V418 Dep, by the author).

Translation: Suppose we are given a graph $G(X, U)$, where each point $x_i \in X$ has weight $v_i > 0$, while each line $u_{ij} \in U$ has cost $c_{ij} \geq 0$. The total weight of all points of the graph is V_0. Cutting of the graph refers to division of G into two subgraphs $G^+(X^+, U^+)$ and $G^-(X^-, U^-)$, where $x_0 \in X^+$, and x_0 is a certain fixed point, while G^+ is always a connected subgraph. The cost of cutting is defined by the cost of the branches "cut": $C = \Sigma c_{ij}$, $x_i \in X^+$, $x_j \in X^-$. The task is set of selecting a cutting of a graph to minimize C under the condition $\Sigma v_i \leq V$, $x_i \in X^+$, $V < V_0$. The discrete problem formulated is replaced by a simplified continuous problem, where the connection of points (or groups of points) to X^+ occurs "continuously," while the cost of cutting also varies

1/2

USSR

German, V. A., Ob. Odnom Algoritme Rasrezaniya Grafov, Riga, 1972, 9 pages.

"continuously." The optimal sequence of attachment (OSA) of points (groups of points) is that which minimizes the "continuous" cost of cutting $C(V)$ for any $V(0 < V < V_0)$. A theorem is formulated and proven on the existence of OSA for an arbitrary connected graph. An algorithm is presented for determination of the OSA. Construction of the OSA does not always guarantee that the optimal solution will be found, but, due to the properties of the OSA, a maximum estimate can be given for the optimal solution. Thus, in contrast to other known heuristic methods, it is easy to check the accuracy and determine the optimal solution.

2/2

GERMAN, V. A.

"On Calculating the Time of Execution of Computer Programs"

Translation: Methods are outlined for calculating the time of execution of machine programs on digital computers. The rate of execution of each block of the program is studied. The analyzed programs are stochastic graph-models. The proposed algorithms may be used for calculating models of high dimensionality since they make extensive use of the structural properties of the investigated graph-models. The apparatus of Boolean matrices is used to establish the different structural properties of the graph-models. Author's abstract.

1/1

USSR

UDC: 519.2

GERMAN, V. A., Editor, "Avtomatika i vychislitel'naya tekhnika"

"Use of Structural Methods for Computing Markov Chain Parameters"

Riga, 1971, 15 pages, illustrated, bibliography of 10 titles
(from RZh--Matematika, No 6, 1972, Abstract No 6V41 Dep)

Translation: The known adaquacy between a system of algebraic equations and
an oriented graph permits the solution of a system with the help of some
transformations in the graph. In this case, the graph allows taking into
account the structural connections between the variables, often resulting in
a large reduction in the amount of calculations. The present paper uses one
of the well-known transformations of the graph: breaks in the curves. The
elimination of the graph's branches, which leads to breaks in the curves,
corresponds to the reduction of a matrix of coefficients to the equivalent
triangular form.

        All the operations for elimination of some of the branches
from the graph are formulated with the use of Boolean matrices,
which makes the algorithm useful for computing large graphs on an
electronic calculator. A Markov chain with absorption is considered as an
application of a graph transformation algorithm. It is shown that all
1/2

USSR

GERMAN, V. A., RZh--Matematika, No 6, 1972, Abstract No 6V41 Dep)

fundamental problems for computing the parameters of Markov chains may be
solved in two steps: in the first, the structural step, the original graph is
transformed into an acyclic one;in the second,the parameters are computed. In
accordance with this system, the author calculates the average frequencies of
occurrence of each state before absorption, and their dispersions, and
investigates the sensitivity of the Markov chain parameters.
    This algorithm is especially effective when a small number of branches
must be eliminated for the graph to be transformed into its acyclic form.

USSR   UDC: 519.2

GERMAN, V. A., Editorial Staff of "Avtomatika i Vychislitel'naya Tekhnika",
Academy of Sciences of the Latvian SSR

"Using Structural Methods to Calculate the Parameters of Markov Chains"

Primeneniye strukturnykh metodov dlya rascheta parametrov markovskikh
tsepey (cf. English above), Riga, 1971, 15 pp, ill., bibl. 10 titles, No
3905-71 Dep. (from RZh-Kibernetika, No 6, Jun 72, Abstract No 6V41 Dep)

Translation: The known correspondence between a system of algebraic equa-
tions and an oriented graph enables solution of the system by means of cer-
tain transformations done on graphs. In a given case, the graph enables
accounting for the structural relations between variables, which often re-
sults in an appreciable reduction of the volume of computations. In this
paper, the author makes use of a well known graph transformation: opening
of loops. The removal of branches of a graph leading to opening of loops
corresponds to reducing the matrix of coefficients to the equivalent tri-
angular form.
     All operations involved in removing certain branches from the graph
are formulated in terms of Boolean matrices, which makes the algorithm
suitable for computer calculations of large graphs. A Markov chain with

1/2

USSR

GERMAN, V. A., Primeneniye strukturnykh metodov dlya rascheta parametrov markovskikh tsepey, Riga, 1971

absorption is considered to illustrate application of the described algorithm. It is shown that fundamental problems concerned with the calculation of Markov chain parameters can be solved in two steps: in the first (structural) stage the initial graph is converted to an acyclic graph, and in the second step the calculation of parameters proper takes place. According to this scheme the author computes the average frequencies of arrival in each state up to absorption and their variances, and investigates the sensitivity of Markov chain parameters.

The described algorithm is especially effective where it is necessary to eliminate a small number of branches to convert the graph to acyclic form.

Transformation and Structure

USSR   UDC 539.89

KUTSAR, A. R., GERMAN, V. N., and NOSOVA, G. I., Institute of Physical
Metallurgy and Metal Physics, Central Scientific Research Institute
of Ferrous Metallurgy imeni A. P. Bardin

"Alpha-Omega-Transformation in Titanium and Zieconium from Shock Waves"

Moscow, Doklady Akademii Nauk SSSR, Vol 213, No 1, Nov-Dec 73, pp 81-83

Abstract: Experiments were conducted to check out the possibility that an
alpha-omega-transformation takes place in titanium and zirconium and the omega-
phase is preserved after impact of a plane shock wave. Tests were made using
titanium and zirconium iodide which were subjected to shock waves of varying
amplitude by placing the samples in an ampule which was detonated with an
explosive charge from a firing pin in the ampule. Pressure magnitude was
determined by experimental measurement of the mass velocity u of the ampule
surface, directly adjoining the sample, using known D-u relationships for the
ampule material (steel Kh18N10T). A small amount of omega-phase was noted in
titanium after exposure to a 350-kbar pressure shock wave at $293°$ K. At this
pressure the residual temperature exceeds the omega-alpha-transformation
temperature. To decrease the residual temperature of the ampule with the sample,
the ampule was cooled with liquid nitrogen to $120°$ K where, after a test, the
1/2

USSR

KUTSAR, A. R., et al., Doklady Akademii Nauk SSSR, Vol 213, No 1, Nov/Dec 73, pp 81-83

sample contained 60-70% omega-phase when subjected to the same shock-wave pressure of 350 kbar. The same effect was noted when zirconium was tested by the same method with approximately 80% omega-phase being produced. The conclusion was made that the omega-phase is formed at $200-300^{6}$ K from a shock-wave front of approximately 5-microsecond duration in titanium and zirconium and the transformation has an athermal martensite nature. Two figures, 19 bibliographic references.

2/2

1/2   055   UNCLASSIFIED   PROCESSING DATE--18SEP70
TITLE--PHASE TRANSFORMATIONS OF TITANIUM AND ZIRCONIUM IN SHOCK WAVES -U-

AUTHOR-(04)-GERMAN, V.N., BAKANOVA, A.A., TARASOVA, L.A., SUTULOV, YU.N.

COUNTRY OF INFO--USSR

SOURCE--FIZ. TVERD. TELA 1970, 12(2) 637-89

DATE PUBLISHED-------70

SUBJECT AREAS--MATERIALS, PHYSICS

TOPIC TAGS--ALLOY PHASE TRANSFORMATION, TITANIUM, ZIRCONIUM, SHOCK WAVE, X
  RAY DIFFRACTION, HIGH PRESSURE EFFECT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1984/0137   STEP NO--UR/0181/70/012/002/0637/0639

CIRC ACCESSION NO--AP0054933
                         UNCLASSIFIED

CIRC ACCESSION NO--AP0054933
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. TI AND ZR SPECIMENS WERE
  INVESTIGATED AFTER A BRIEF IMPULSE LOADING WITH THE AID OF SHOCK WAVES
  OF AMPLITUDE 120, 200, 350, AND 500 KILOBARS. AFTER SHOCK TREATMENT,
  THE SPECIMENS WERE ANALYZED BY X RAY DIFFRACTION. IN ALL ZR SPECIMENS
  AT ALL AMPLITUDES OF SHOCK PRESSURE, LINES OF A NEW PHASE WERE OBSD.
  THE MAX. AMT. OF THE NEW PHASE, EXCEEDING THE AMT. OF INITIAL PHASE, WAS
  OBTAINED AT A PRESSURE OF 350 KILOBARS. THE NEW PHASE IS BCC. WITH
  ALPHA EQUALS 3.568 ANGSTROM AND D. EQUALS 6.656.   FOR TI, THE NEW PHASE
  WAS OBTAINED AT A PRESSURE OF 350 KILOBARS. IT IS CUBIC WITH ALPHA
  EQUALS 3.27 ANGSTROM.

UNCLASSIFIED

USSR

UDC 621.382.002

GERMAN, YU. I., YEVSEYEV, YU. A., KABAKOV, V.L., RABINERSON, A.A., CHESNOKOV, YU.A.

"Evaluation Of The Effectiveness Of Clamped Contact Connections For Semiconductor Power Devices During Operation In A Regime Of Pulse Overload By Forward Current"

Translation: In addition to the reduction of superheating, replacement of soldered contacts by clamped contacts relieves the silicon wafer from the thermoelectromotive forces, which makes it possible to increase its overload capacity. The effectiveness of Si-Cu and W-Cu clamped contacts of dissimilar fulfillment were evaluated in a regime of pulse overload by a comparison of the experimental and theoretical values of the temperature of superheating of a p-n junction in the process of cooling the structure after the action of an individual semisinusoidal pulse of forward current. The overload capacity of devices with clamped contacts for TT-2 thyristors was increased 1.4 times on the average in comparison with devices having soldered contacts and thermocompensators. 5 ref. G.I.

1/1

USSR.

BELITSKIY, M. Ye., BATURIN, G. T., GAYDARENKO, A. L., GERMANCHUK, F. K., SKRIPKA, V. F.

"Study of the Chemical Stability of Certain Nonmetallic Components of Friction Materials at High Temperatures"

Translation: Studies of the chemical stability of widely used, promising nonmetallic components and solid lubricants of friction metalloceramic materials are described. Recommendations are made as to their application as high-temperature solid lubricants for friction materials of heavy-load braking devices: boron nitride, 2-calcium fluoride and synthetic mica. 6 ill., 1 table, 7 ref. Resume.

1/1

USSR   UDC 615.21:547.665

MARKAVA, E. YA., AREN, A. K., and GERMANE, S. K., Institute of Organic
Synthesis, Academy of Sciences LatvianSSSR, Riga

"Synthesis and Physiological Activity of 2,2'-Diamino-2,2'-(phenylene)-bis-
-indanediones-1,3"

Abstract: It has been shown that 2,2'-dibromo-2,2'-(p-phenylene)-bis-
-indanediones-1,3 react via nucleophilic halogen exchange with primary and
secondary amines in anhydrous dioxane or ether to yield   2,2'-diamino-
-2,2'-(p-phenylene)-bis-indanediones-1,3. A series of derivatives was
prepared, all compounds showing some tranquilizing action ; amino-m-pheny-
lene-bis-indanediones exhibited higher activity than the p-phenylene homo-
logs. Compounds with the dimethylamino group in their structure were more
active than comparables diethylamino derivatives. A transition from p-
-phenylene to m-phenylene derivatives resulted in disappearance of the anal-
gesic activity.

1/1

USSR

UDC 615.213:547.754

OZOLIN SH, Ya. V., and GERMANE, S. K., Institute of Organic Synthesis, Academy of Sciences Latvian SSR

"Study of the Pharmaceutical Properties of Some 2-(δ-aminobutynyl) Indane--1,3-diones and 2-(δ-aminobutynyl) Indane-1,3-diols. II. A Study of the Tranquilizing Properties"

Riga. Izvestiya Akademii Latviyskoy SSR, 1972, No 11(304), pp 97-101

Abstract: Thirty specific indanes were tested for toxicity (LD_{50} method) and tranquilizing properties in white mice. The substitutions occurred on the 2-carbon of the indane ring and on the terminal nitrogen. A study of the drugs' influence of muscle tone and coordination was also performed. All compounds tested indicated some tranquilizing action. The greatest effect was demonstrated by the phenylindanes, having a phenylpiperazine radical at the terminalnnitrogen. The least effect was demonstrated by those compounds having a quaternary nitrogen, i.e., those derived from the iodide salt of the indane-dione. The dione and its corresponding diol did not differ significantly in their tranquilizing effect.

1/1

USSR   UDC 615.21:547.665

AREN, A. K., BERZINYA, I. A., GEYTA, L. S., and GERMANE, S. K., Institute of Organic Synthesis Ac. Sc. Latvian SSR

"2-[γ-(N-Arylpiperazino)propyl]-2-arylindandiones-1,3 and -indandiols-1,3"

Abstract: In continuation of the search for neuro- and psychotropic agents, a series of title compounds was synthesized. To 2.3 g sodium dissolved in 200 ml of n-propanol, 22.5 g 2-phenylindandione-1,3, 24 g 1,3-dibromopropane, and 14.9 g NaI are added and refluxed for 8-10 hrs. The solution is then cooled, poured into water, the separated oil phase is dissolved in benzene, washed with sodium bicarbonate solution and dried over magnesium sulfate. Benzene is evaporated and the 2-(γ-bromopropyl)-2-phenylindandione-1,3, m.p. 88° is isolated by chromatography on an alumina column. Analogously 2-(γ-chloropropyl)2-(p-methoxyphenyl)-indandione-1,3, b.p. 160-70°/10⁻² mm Hg, and 2-(γ-hydroxypropyl)-2-phenylindandione-1,3, m.p. 78° were prepared. To convert these intermediates to 2-[γ-(N-arylpiperazino)-propyl]- 2-arylindandiones-1,3, above compounds were dissolved in benzene and respective N-arylpiperazines in benzene were added, the mixture being refluxed for 1/2

USSR

AREN, A. K., et al, Khimiko-Farmatsevticheskiy Zhurnal, Vol 4, No 12, Dec 70,
pp 6-10

0.5-1 hr, cooled, and filtered. The precipitated hydrochloride is saturated
with HCl, the product filtered, suspended in water, aqueous ammonia is added
and the only product crystallized in alcohol. Pharmacological studies showed
all compounds to exhibit tranquilizing activity, the most active being the
m-substituted arylpiperazine derivatives. All of the indandio-1,3 derivatives
exhibited toxicity which increased with the increased number of methyl groups
between the diketo group and N-arylpiperazine.

2/2

USSR   UDC 576.858.73.095.57

VORONTSOVA, T. V., GERMANOV, A. B., and SOKOLOV, M. I., Institute of Virology
imeni D. I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow

"Induction of S-Mutation in Fowl Plague Virus by Ethylenimine"

Abstract: Four mutants, formed spontaneously or induced by ethylenimine, were
isolated from a population of the L_{D2} large-plaque strain of fowl plague virus:
a micro-plaque mutant, a small-plaque mutant which was stimulated by protamine
sulfate, a small-plaque mutant which was not stimulated by protamine sulfate,
and a medium-plaque mutant. All mutants were genetically stable. Ethylenimine
was very effective in inducing mutations when it was applied to a reproducing
population of fowl plague virus. Optimal conditions for induction of S-mutations
with ethylenimine were established. A correlation was found to exist between
the lethal and mutagenic effects on one hand and the stage of virus replication
on the other hand. The most pronounced lethal and mutagenic effects took place
when ethylenimine was applied in the first two hours of virus replication.

1/1

TITLE--GENETIC MARKERS OF HERPES SIMPLEX VIRUS COMMUNICATION 2:
    INVESTIGATION OF GENETIC MARKERS OF THE US STRAIN OF HERPES SIMPLEX

AUTHOR-(04)-RUDNEVA, I.A., GERMANOV, A.G., MYASNIKOVA, I.A., SOKOLOV, M.I.

COUNTRY OF INFO--USSR

SOURCE--VOPROSY VIRUSOLOGII, 1970, NR 2, PP 182-186

DATE PUBLISHED-------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--HERPES SIMPLEX VIRUS, TISSUE CULTURE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1990/0729   STEP NO--UR/0402/70/000/002/0182/0186

CIRC ACCESSION NO--AP0108935
                        UNCLASSIFIED

CIRC ACCESSION NO--AP0108935
ABSTRACT/EXTRACT--(U) GP-0-   ABSTRACT.   A VARIANT OF THE US STRAIN OF
  HERPES SIMPLEX VIRUS PRODUCING A CYTOPATHIC EFFECT IN HUMAN EMBRYO AND
  CHICK EMBRYO FIBROBLAST CULTURES WAS STUDIED.   DIFFERENT SENSITIVITY OF
  THE US STRAIN TO SULFATED AGAR POLYSACCHARIDES DEPENDING ON THE TYPE OF
  CELL CULTURE WAS DEMONSTRATED: COMPLETE INHIBITION OF PLAQUE PRODUCTION
  WAS OBSERVED ONLY IN CHICK EMBRYO FIBROBLAST CULTURE BUT NOT IN HUMAN
  EMBRYO FIBROBLASTS.   THE VARIANT UNDER STUDY WAS FOUND TO BE SENSITIVE
  TO 5,BROMODEOXYURIDINE AND TO BE INCAPABLE OF REPRODUCTION AT HIGH
  TEMPERATURE.

UNCLASSIFIED

1/2   024   UNCLASSIFIED   PROCESSING DATE--18SEP70
TITLE--GENETIC MARKERS OF HERPES SIMPLEX VIRUS COMMUNICATION 1:   SOME
   GENETIC MARKERS OF K STRAIN OF HERPES SIMPLEX VIRUS OF THE SECOND
AUTHOR-(03)-GERMANOV, A.G., RUDNEVA, I.A., SOKOLOV, M.I.

COUNTRY OF INFO--USSR

SOURCE--VOPROSY VIRUSOLOGII, 1970, NR 2, PP 166-170

DATE PUBLISHED-------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--HERPES SIMPLEX VIRUS, TISSUE CULTURE, MICROORGANISM GENETICS,
   ANTIGEN, DRUG RESISTANCE, BROMINATED ORGANIC COMPOUND

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1990/0726   STEP NO--UR/0402/70/000/002/0166/0170

CIRC ACCESSION NO--AP0108932
                        UNCLASSIFIED

CIRC ACCESSION NO--AP0108932
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. NINE CLONES OF THE K STRAIN OF
   HERPES SIMPLEX VIRUS PRODUCING OPAQUE PLAQUES IN CHICK EMBRYO FIBROBLAST
   CULTURES WERE ISOLATED. THESE CLONES JUST AS THE ORIGINAL STRAIN SHOWED
   NO CYTOPATHIC EFFECT IN CHECK EMBRYO FIBROBLAST CULTURES.   MARKED
   AUTOINTERFERENCE OF PLAQUE FORMATION IN THE CLONES UNDER STUDY WAS
   DEMONSTRATED. THESE CLONES WERE FOUND TO INDUCE SYNTHESIS OF A
   SIGNIFICANT AMOUNT OF INTERFERON IN CHICK EMBRYO FIBROBLAST CULTURES.
   INVESTIGATION OF OTHER PROPERTIES, INCLUDING RESISTANCE TO
   5,BROMODEOXYURIDINE AND CAPACITY FOR REPRODUCTION AT HIGH TEMPERATURE,
   PERMITS TO CHARACTERIZE THE ISOLATED CLONES OF THE K STRAIN AS ATYPICAL
   VARIANTS OF HERPES SIMPLEX VIRUS.

UNCLASSIFIED

Magnesium

GERMANOV, Ye. P., and SHIVRIN, O. N., Petrozavodsk State University imeni
O. V. Kuusinen

"Dimensional Effect in Magnesium-Cadmium Alloys"

Abstract: A study was made of the nature of distortion of the crystalline
lattice of close-packed hexagonal solid solutions. Hardened and annealed
Mg-Cd alloys (Cd from 5 to 20 at%) were investigated. All alloys in both
the hardened and annealed states have a tendency toward short-range order,
a fact which was substantiated by the shape of the curves of angular dis-
tribution of the diffusion phonon. In cadmium-base alloys the model of
the elastic isotropic continuum in the first approximation is fully accep-
table. The atoms of the diffusing component Mg change its state to a great
extent as compared to the atoms of diffuser Cd.

1/1

1/2   033   UNCLASSIFIED   PROCESSING DATE--04DEC70
TITLE--THERMAL DIFFUSION SCATTERING OF X RAYS IN HEXAGONAL POLYCRYSTALS
   -U-
AUTHOR-(02)-GERMANOV, YE.P., SHIRVIN, O.N.

COUNTRY OF INFO--USSR

SOURCE--FIZ. TVERD. TELA 1970, 12(4), 1228-31

DATE PUBLISHED-------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--THERMAL DIFFUSION, X RAY SCATTERING, DEBYE TEMPERATURE, HEAT
   CAPACITY, CRYSTAL, THERMAL EFFECT, MAGNESIUM, CADMIUM

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3002/0213   STEP NO--UR/0181/70/012/004/1228/1231

CIRC ACCESSION NO--AP0127824
                           UNCLASSIFIED

CIRC ACCESSION NO--AP0127824
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT.   IN TERMS OF THE DEBYE THEORY OF
  HEAT CAPACITY OF CRYSTALS, IT IS POSSIBLE TO APPLY A PREVIOUSLY DERIVED
  EXPRESSION FOR THE MODULATION OF THERMAL SCATTERING OF X RAYS TO
  HEXAGONAL POLYCRYSTALS. THE OBTAINED EXPRESSION OF THE MODULATING
  FUNCTION OF THERMAL DIFFUSE SCATTERING WAS VERIFIED BY COMPARISON WITH
  MEASURED THERMAL SCATTERING OF X RAYS ON PURE SPECIMENS OF MG AND CD.
  SATISFACTORY AGREEMENT WAS OBTAINED BETWEEN EXPT. AND CALCNS.
  FACILITY: PETROZAVODSK. GOS. UNIV. IM. KUUSINENA, PETROZAVODSK, USSR.

UNCLASSIFIED

DISORDER IN ACCEPTOR FUNCTION OF TRANSFER RNA's FROM RABBIT LIVER AT INSULIN INSUFFICIENCY

Ya. L. Germanyuk, V. I. Mironenko

The Laboratory of Biochemistry Research Institute of Endocrinology and Metabolism, Kiev

The insulin insufficiency by means of alloxan administration has been induced in rabbits. From livers of both diabetic and healthy aminals the total sRNA and aminoacyl RNA-synthetases have been isolated. The level of aminoacyl sRNA formation was studied. It was noted that "diabetic" sRNA less effectviy accepts $I-C^{14}$-lysine, $I-C^{14}$-methionine and $I-C^{14}$-leucine under catalytic action of "diabetic" as well as "healthy" aminoacyl RNA synthetases. At the same time "healthy" RNA's with "healthy" synthetases do it more readily. From these results one may conclude that one of the possible reasons for decreased level of aminoacyls sRNA formation in the liver of animals with insulin insufficiency is transfer RNA itself.

D. *M*.

1/1   *2*

REEL/FRAME
19730160

USSR   UDC 669.15'27-194

STROGANOV, A. I., PYL'NEV, Yu. A., CHERNYSHEV, E. Ya., KEYS, N. V., PAKULEVA,
V. S., DONETS, I. D., KHOLODOV, Yu. A., and GERMELIN, F. A., Chelyabinsk
Polytechnical Institute; Chelyabinsk Metallurgical Plant

"Tungsten Losses in the Production of High-Speed Steel"

Abstract: Data are presented on seven melts of R18, R12, and R6M3 high-speed
steels, an analysis is made of tungsten electric steelmelting and forge
conversion processes, and methods are presented for utilizing scrap of
tungsten-bearing steels. From the study the following conclusions can be
made: as the tungsten content in the steel is increased, its assimilation
decreases. A decrease in the proportion of tungsten through the ferro-
alloys as well as a decrease in the consumption of oxygen for blowing fa-
cilitate a more complete assimilation of tungsten by the metal. A substan-
tial portion of tungsten is lost with the scrap and reguli in the slag
(0.34%), the emery dust, and scale during forging. A thorough extraction
of tungsten from slag and scale is suggested. Means for reducing tungsten
losses in the process of heating castings and ingots in the furnaces include
1/2

USSR

STROGANOV, A. I., et al, Metallurg, No 1, Jan 71, pp 21-23

a nonoxidizing atmosphere, more rapid heating, and application of a protective
coating to ingots prior to heating. To decrease decarburization and scale
formation, the Chelyabinsk Metallurgical Plant has recently been using
coatings comprising refractory clay (20%), M40 carborundum powder (6%),
fine graphite (6%), commerical borax (3%), and liquid glass (65%).

2/2

GERMER, M. Z., Latvian Scientific Research Institute of Experimental and Clinical Medicine, Ministry of Health, Latvian SSR

"Effect of a Static Electric Field on the Cardiac and Respiratory Rate in the Rat"

Abstract: The effect of a static electric field (1,500 to 2,250 v/cm) on the cardiac and respiratory rates of grounded rats under nembutal anesthesia was investigated during and after 30 minutes' exposure. Changes in the cardiac rate were the same as in the control. The slight decrease noted in both groups was apparently caused by the anesthesia, for the rate gradually increased toward the end of the experiment when the rats began to awaken. The static electric field slowed the respiratory rate slightly compared with the control, but the difference was statistically insignificant.

1/1

USSR   UDC: 518.90

GERMEYER, Yu. B.

"Theory of Three-Player Games"

Abstract: The author finds it useful to continue studying the ap-
proach to game theory known as the principle of best guarantee of
results. This approach has been applied in the investigation of
nonantagonistic games involving two players. Since it has proved
successful in the theory of hierarchical systems and the theory of
"meta-games," it is used in the present paper for the theory of
games with three participants involving mutual information exchan-
ges among the players and the order of their moves. A number of
variants of the problem are considered.

1/1

C.   Operations Research

USSR

GERMEYER, YU. B.

"Study of Operations and Games Theory"

Teoriya Igr [Games Theory -- Collection of Works], Yerevan, 1973, pp 125-127 (Translated from Referativnyy Zhurnal Kibernetika, No 10, 1973, Abstract No 10V428)

Translation: The relationships between operations research and games theory are redefined by introducing undefined factors and the concept of strategies as functions of greater information content concerning an operating individual than those of operations research (one variety of undefined factor is the incomplete knowledge of the effectiveness criterion). The principle of best guaranteed result (maximin) is suggested as a rather universal principle for selection of strategies under conditions of uncertainty.

1/1

GERMEYER, Yu. B., SUKHORUCHENKO, E. M.

"Optimum Distribution of Resources in Attempting to Reach a Given Effectiveness on All Sections"

V sb. Kibernetiku -- na sluzhbu kommunizmu. T. 6 (Cybernetics in the Service of Communism--collection of works. Vol 6), Moscow, "Energiya", 1971, pp 233-248 (from RZh-Matematika, No 11, Nov 71, Abstract No 1V667)

Translation: A game is considered in which the strategies of the first player are vectors $x = (x_1, x_2, \ldots, x_n)$ which satisfy the conditions

$$\sum_{i=1}^{n} x_i = X_0, \quad x_i \geq 0.$$

while the strategies of the second player are vectors $y = (y_1, y_2, \ldots, y_n)$ which satisfy the conditions

$$\sum_{i=1}^{n} y_i = Y_0, \quad y_i \geq 0.$$

1/2

USSR

GERMEYER, Yu. B., SUKHORUCHENKO, E. M., <u>Kibernetiku -- na sluzhbu kommunizmu. T. 6,</u> Moscow, "Energiya", 1971, pp 233-248

The first player attempts to satisfy the conditions $f_i(x_i, y_i) \geq \omega_i$ for all i, which can be achieved by maximization with respect to the function $\Phi(x, y) = \min(f_i(x_i, y_i)/\omega_i)$. The pure (maxmin) strategy for the first player is determined for varied information on the second player's strategy. The game is generalized to the case where X_i, Y_i, x_i, y_i are vectors. L. Bregman.

2/2

USSR

GERMEYER, Yu. B., MOYSEYEV, N. N.

"Some Problems in the Theory of Hierarchical Control Systems"

Probl. Prikl. mat. i Mekh. [Problems of Applied Mathematics and Mechanics
-- Collection of Works], Moscow, Nauka Press, 1971, pp 30-43, (Translated
from Referativnyy Zhurnal, Kibernetika, No 3, 1972, Abstract No 3 V463
from the Resume).

Translation: A number of problems are stated on the optimization of the
results of operation of a system consisting of a center and producer when
their interests do not coincide. Control by means of distribution of re-
sources among producers by the center is studied and the corresponding
problems in optimal control are stated. An example is used to show that
control of resources from the standpoint of the interests of the center
may be ineffective. Then, control using a system of rewards and penalties
is studied in a linear statement. With a sufficient range in the system,
complete controlability of producers in the interests of the center is
demonstrated. The corresponding optimization problems are formulated in
general form. The initial point of this control system is the assumption
of precise knowledge of the interests and behavior of the producers by the
center. Complications arising if the information is inaccurate are indi-
cated.
1/1

USSR

GERMEYER, Yu. B.

"Games Concepts in Systems Research"

Issled. Sistem. Materialy Vses. Simpoz. [Systems Research. Materials of All-Union Symposium], Moscow, 1971, pp 50-64, (Translated from Referativnyy Zhurnal, Kibernetika, No 2, 1972, Abstract No 2 V635).

NO ABSTRACT.

1/1

USSR

GERMEYER, Yu. B.

"Introduction to the Theory of Operations Research"

Vvedeniye v teoriyu issledovaniya operatsiy (cf. English above), Moscow, "Nauka", 1971, 383 pp, ill. 1 r. 55 k. (from RZh-Kibernetika, No 1, Jan 72, Abstract No 1V740 K)

Translation: Chapter 1: On Formalization and Basic Principles of Operations Research; Chapter 2: Evaluating the Effectiveness of Strategies (Decisions); Chapter 3: Optimum Strategies.

UDC: 518.9

USSR

GERMEYER, Yu. B., SUKHORUCHENKO, E. M.

"Optimum Distribution of Resources When Attempting to Reach a Predetermined Effectiveness on All Sections"

V sb. Kibernetiku -- na sluzhbu kommunizmu(Cybernetics to the Service of Communism -- collection of works), T. 6, Moscow, "Energiya", 1971, pp 233-248 (from RZh-Kibernetika, No 11, Nov 71, Abstract No 11V667)

Translation: The authors consider a game in which the strategies of the first player are the vectors $x = (x_1, x_2, \ldots, x_{nk})$ which satisfy the conditions

$$\sum_{i=1}^{n} x_i = X_0, \quad x_i > 0, \qquad (1)$$

and the strategies of the second player are the vectors $y = (y_1, y_1, \ldots, y_n)$ which satisfy the conditions

$$\sum_{i=1}^{n} y_i = Y_0, \quad y_i > 0. \qquad (2)$$

1/2

USSR

GERMEYER, Yu. B., SUKHORUCHENKO, Yu. M., Kibernetiku -- na sluzhbu kommunizmu, T. 6, Moscow, "Energiya", 1971, pp 233-248

The first player attempts to ensure fulfillment of the conditions $f_i(x_i, y_i) \geq w_i$ for all i, which is achieved for instance by maximizing the function $\Phi(x, y) = \min_i (f_i(x_i, y_i)/w_i)$. The pure (maximum) strategy of the first player is deter-

mined for various information on the strategies of the second player. The game is generalized to the case where X_*, Y_*, x_i, y_i are vectors. L. Bregman.

2/2   - 26 -

UDC: 518.9

USSR

GERMEYER, Yu. B.

"Game Concepts in Systems Analysis"

Metody upr. bol'shimi sistemami. T. 1 (Methods of Controlling Large Systems. Vol 1), Irkutsk, 1970, pp 4-24 (from RZh-Kibernetika, No 9, Sep 71, Abstract No 9V467)

Translation: The author considers coalitionless games in which one of the players is assumed to be disinterested (this player may be interpreted as nature, generating uncontrollable factors, and uncertainties in the goals of the players which are indistinguishable from these factors), while one other player is set apart and is called the operating side. Certain classes of games are described in this terminology.

The principle of optimality is defined as some functional expression for the goal of the operating side in terms of the goals of the other players. These principles may lead the other players to enter into a coalition. The author proposes using the principle of the guaranteed result to evaluate the effectiveness of the system, and as a basis for making recommendations on selecting strategies. N. Vorob'yev.

1/1

- 28 -

USSR

GERMEYER, Yu. B.

"Reduction of Vector Effectiveness Criteria to a Single Criterion with Uncertainty in Convolution Parameters"

Translation: Various methods of reduction of partial criteria of effectiveness to a single criterion are studied. The most general method suggested is

$$F(x, y) = \min_{\lambda \in E} \left[\sum_{i=1}^{n} \lambda_i f_i(x, y) + \lambda_0 \right].$$ (1)

where x are the factors tested, y are untested factors, $\lambda = \{\lambda_0, \lambda_1, \ldots, \lambda_n\}$, E is a certain set of possible changes in vectors λ. The purpose of the operation is to increase the values of $F(x, y)$. An informal interpretation of formula (1) is also presented, related to the lack of information on values of λ_i with various assumptions concerning the form of set E.

1/1

- 20 -

UDC: 550.834

USSR

ALABUZHEV, P. M., GALYNIN, N. A., GERNER, I. I., GRITCHIN, A. A., ZUYEV, A. K., NIKITIN, A. A., KHON, V. F., Novosibirsk Electrical Engineering Institute

"A Seismic Receiver"

Translation: This Author's Certificate introduces a seismic receiver which contains a housing, an inertial mass and a displacement registering device. As a distinguishing feature of the patent, the sensitivity of the receiver is improved and the measurement range is extended by suspending the inertial mass on two preformed flat elastic strips which are securely fastened by their ends to the housing. The strips are securely fastened in the middle above and below to the inertial mass, and regulating screws press against the end faces of the strips.

1/1

- 138 -

1/2   011   UNCLASSIFIED   PROCESSING DATE--04DEC70
TITLE--CATALYST FOR METHANOL SYNTHESIS -U-

AUTHOR-(04)-SUSHCHAYA, L.E., BONDAR, P.G., GERNET, D.V., LELEKA, V.E.

COUNTRY OF INFO--USSR

SOURCE--U.S.S.R. 264,355
REFERENCE--OTKRYTIYA, IZOBRET., PROM. OBREZTSY, TOVARNYE ZNAKI, 1970 47
DATE PUBLISHED--03MAR70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--METHANOL, CATALYTIC ORGANIC SYNTHESIS, CHEMICAL PATENT, ZINC
   OXIDE, CHROMIUM OXIDE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3007/0846   STEP NO--UR/0482/70/000/000/0000/0000

CIRC ACCESSION NO--AA0136280
                          UNCLASSIFIED

UNCLASSIFIED   PROCESSING DATE--04DEC70
CIRC ACCESSION NO--AA0136280
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE TITLE CATALYST, CONSISTING OF
  ZNO AND CRO, CONTAINS NH SUB4 TUNGSTATE, NH SUB4 MOLYBDATE, AND URANYL
  NITRATE THAN CAN BE BROKEN DOWN EASILY TO THE CORRESPONDING OXIDES, AND
  WHICH WEIGH 0.001-2.0 WT. PERCENT (PREFERABLY 0.001-0.1 WT. PERCENT) OF
  THE CORRESPONDING OXIDE.

UNCLASSIFIED

USSR

UDC 543.27:628.512

PEREGUD, YE. A., BYKHOVSKAYA, M. S. (deceased), and GERNET, YE. V.

"Rapid Methods for Determination of Harmful Substances in Air"

Moscow, "Khimiya" Publishing Company, 1970

Abstract: The apparatus, methods of sampling and rapid methods for the determination of toxic substances in air are described in this book. Domestic and foreign-made gas analyzers, both stationary and portable ones are described as well as methods for the preparation of mixtures with known gas composition for calibration of the instruments and testing the methodology. The book is intended for workers in scientific research institutes, sanitation-epidemiologic and gas-safety stations, plant laboratories and other organizations involved in atmospheric studies. There are 142 figures, 12 tables and 377 literature references in the book.

1/1

- 20 -

Analytical Chemistry

USSR   UDC 543.27:628.512

PEREGUD, YE. A., BYKHOVSKAYA, M. S.(Deceased), and GERNET, YE. V.

"Rapid Methods for Determination of Harmful Substances in Air"

Moscow, "Khimiya" Publishing Company, 1970

Translation: Table of Content

1/24

USSR

PEREGUD, YE. A., et al., "Rapid Methods for Determination of Harmful
Substances in Air"

2/24

USSR

PEREGUD, YE. A., et al., "Rapid Methods for Determination of Harmful
Substances in Air"

3/24

USSR

PEREGUD, YE. A., et al., "Rapid Methods for Determination of Harmful
Substances in Air"

4/24

USSR

PEREGUD., YE. A., et al., "Rapid Methods for Determination of Harmful Substances in Air"

    5/24

USSR

PEREGUD, YE. A., et al., "Rapid Methods for Determination of Harmful
Substances in Air"

6/24

USSR

PEREGUD, YE. A., et al., "Rapid Methods for Determination of Harmful
Substances in Air"

7/24

USSR

FEREGUD, YE. A., et al., "Rapid Methods for Determination of Harmful Substances in Air"

8/24

USSR

PEREGUD, YE. A., et al., "Rapid Methods for Determination of Harmful Substances in Air"

9/24

USSR

PEREGUD, YE. A., et al., "Rapid Methods for Determination of Harmful
Substances in Air"

10/24

USSR

PEREGUD, YE. A., et al,, "Rapid Methods for Determination of Harmful Substances in Air"

USSR

PEREGUD, YE. A., et al., "Rapid Methods for Determination of Harmful Substances in Air"

12/24

USSR

* PEREGUD, YE. A., et al., "Rapid Methods for Determination of Harmful
Substances in Air"

13/24

USSR

PEREGUD, YE. A., et al., "Rapid Methods for Determination of Harmful
Substances in Air"

    14/24

- 14 -

USSR

PEREGUD, YE. A., et al., "Rapid Methods for Determination of Harmful
Substances in Air"

USSR

PEREGUD, YE. A., et al., "Rapid Methods for Determination of Harmful
Substances in Air"

16/24

USSR

FEREGUD, YE. A., et al., "Rapid Methods for Determination of Harmful Substances in Air"

17/24

USSR

PEREGUD, YE. A., et al., "Rapid Methods for Determination of Harmful
Substances in Air"

18/24

- 72 -

USSR

PEREGUD, YE. A., et al., "Rapid Methods for Determination of Harmful
Substances in Air"

19/24

USSR

PEREGUD, YE. A., et al., "Rapid Methods for Determination of Harmful
Substances in Air"

20/24

USSR

PEREGUD, YE. A., et al., "Rapid Methods for Determination of Harmful
Substances in Air"

21/24

USSR

PEREGUD, Ye. A., et al., "Rapid Methods for Determination of Harmful
Substances in Air"

22/24

- 18 -

USSR

PEREGUD, YE. A., et al., "Rapid Methods for Determination of Harmful Substances in Air"

23/24

USSR

PEREGUD, YE. A., et al., "Rapid Methods for Determination of Harmful Substances in Air"

24/24

Analytical Chemistry

USSR   UDC 543:615.9

PEREGUD, Ye. A. and GERNET, Ye. V.

Khimicheskiy Analiz Vozdukha Promyshnlennykh Predpriyatiy (Chemical Analysis
of the Air of Industrial Enterprises), Issue No 2, Corrected and Supplements,
Leningrad, "Khimiya," 1970, pp 2, 3-8, 9-12, 13-15

Translation:
    Annotation: Methods of sanitary-chemical analysis of the air in industrial
enterprises are described in the book; particular attention is given to the
identification of toxic substances for which maximum allowable concentrations
in the air of industrial premises have been established.
    The second issue has been supplemented with methods for the determination
of the maximum allowable concentrations (PDK) of new chemicals being intro-
duced in industry. A number of methods described in issue one have been
replaced by more rational and improved methods making possible the completion
of the analysis faster, with a smaller volume of air, and with greater
precision.
    The book is intended for chemists working in analytical laboratories of
industrial enterprises, sanitary-epidemiological stations, and scientific-
research institutes. Illustrations: 24. Tables: 233

USSR

PEREGUD, Ye. A. and GERNET, Ye. V., Khimiya, 1970, pp 2, 3-8, 9-12, 13-15

Preface: Problems concerning the prevention of occupational intoxications and diseases are given a great deal of attention in Soviet sanitary legislation. The prophylaxis of occupational intoxications has become during the past few years one of the elements in the planning of new technological processes and industrial enterprises.

Not only do the organs of sanitary supervision exercise control in the course of the enterprise planning process, but also in the course of the practical implementation of the projects. These activities are being accomplished on a base of sanitary rules which stipulate the requirements with relation to the construction and maintenance of industrial enterprises of the different branches of industry and also working conditions when working with various toxic substances.

One of the basic directions of the struggle against acute as well as chronic occupational diseases is the hygienic standardization of the industrial environmental air, that is the establishment of maximum allowable quantities of toxic substances in the air of working premises.

Understood under the concept of maximum allowable concentrations (PDK) are such concentrations of different toxic chemical substances found in the

2/27

- 2 -

USSR

PEREGUD, Ye. A. and GERNET, Ye. V., Khimiya, 1970, pp 2, 3-8, 9-12, 13-15

air of industrial enterprises in the form of gases, vapors, and dust which despite their daily effect on the workers in the course of the working day and an unlimited duration of the working period will fail to induce any pathological changes or diseases detectable by modern means of investigation.*

The established maximum allowable concentrations pertain to working areas understood to be areas where workers constantly or periodically remain for the purpose of supervision or operation of production processes. If the productions are carried out at different points of the working premise, then the entire premise is regarded as a working area.

Inasmuch as the respiratory tract (inspiration) is the main pathway through which a poisonous substance gains entry into the organism, the prevention of environmental air pollution is the main means of preventing the development of occupational intoxications.

---

* LETAVET, A. A. Data on the proceedings of the International Symposium concerning maximum allowable concentrations of toxic substances in industry, Praguem 1959.

3/27

Organizations projecting a technological process, production equipment, and ventilating installations (in calculating air exchange), and also the organs which supervise industrial sanitation and hygienic control over the state of the environmental air at working premises must be guided by the legally established maximum allowable concentration values.

The air content of toxic substances at the level of maximum allowable concentrations can in no way be regarded as the optimum for the environmental air. All means at the disposition of modern technology are aiming to attain concentrations considerably smaller than those established, and in many cases bring these concentrations to zero value.

The maximum allowable concentrations of toxic substances are subjected to periodic reexamination. A comparison of the established values with concentration values found in the air of a working premise on the one hand, and the state of workers' health on the other hand provides a basis for changing the maximum allowable concentrations, and in a number of cases serves as an indication of the imperfection of the technological process from a hygienic point of view.

The practice of establishing norms in labor hygiene just as the practice of establishing norms in technology is closely linked with the methods used in measuring regulation values. Without the existence of such methods the

4/27

- 3 -

USSR

PEREGUD, Ye. A. and GERNET, Ye. V., Khimiya, 1970, pp 2,3-8, 9-12, 13-15

establishment of maximum allowable concentrations loses its practical signifi-
cance. These methods must possess sensitivity permitting the determination of
values equal to those of PDK, and when possible conducted with the use of a
small volume of air obtained in a brief fragment of time. The latter is of
principal significance, for a prolonged period of sample gathering produces
a mean value which fails to provide a representation of the briefly-lasting
high concentrations exceeding the maximum established norms.

The control of the environmental air when linked with problems of estab-
lishing PDK norms, arbitrary analysis in particular, is a highly responsible
type of analysis. Nevertheless, there are no handbooks which provide a summa-
tion of experience gained in analytical work in this direction and oriented
toward the unification of the used methods.

The authors when compiling this practical handbook attempted to bridge
this gap in literature concerning air analysis.

Methods described in Soviet and foreign literature and revised by the
authors making them applicable in conditions for the establishment of norm
values were used as materials for this book. For a considerable number of
substances new methods have been developed.

5/27

USSR

PEREGUD, Ye. A. and GERNET, Ye. V., Khimiya, 1970, pp 2,3-8, 9-12, 13-15

     Methods of identification of a large number of toxic substances for which
PDK have been established in accordance with the list published in the sanitary
norms for the projection of industrial enterprises. Sn 245-63 [Construction
norms 245-63] with subsequent supplements are described.
     A number of new methods mainly based on the application of catalysis,
hemoabsorption, and new color reactions along with the methods for the deter-
mination of PDK most of which are utilized in the practice of sanitary-
chemical analysis are described in the book.
     The presence in the book of new and improved methods of detection of
toxic substances in the air, and the presentation of the existing methods in
accordance with the established maximum allowable concentration values permits
the hope that the book will be useful to chemists working in the area of analysis
of industrial environmental air.
     The second issue of this handbook is supplemented by a considerable num-
ber of methods (more than 50) of determination of rew chemical substances being
introduced into industry.
     A number of methods described in the first issue have been reexamined and
replaced by more rational and improved methods making it possible to complete

6/27

- 4 -

USSR

PEREGUD, Ye, A. and GERNET, Ye. V., Khimiya, 1970, pp 2, 3-8, 9-12, 13-15

an analysis faster, with a smaller volume of air, and with greater accuracy (hydrogen cyanide, vinyl chloride, hydrogen chloride, and others).

Particular attention is paid to group analytical methods with prospects of their application to the even larger number of toxic substances being used in industry (aliphatic amines, carbonyl compounds, halogen derivatives of hydrocarbons, and others).

Introduction: An air analysis of industrial enterprises has for its object the detection of gases, vapors, and aerosols which exert a harmful effect on the human organism.

The sources polluting the industrial environmental air are technological processes linked with the utilization or formation of toxic volatile substances.

With equipment inadequately hermetically sealed, particularly hazardous processes poorly encapsulated, and the absence of or use of inadequately effective sanitary technical devices, mainly ventilation, the concentrations of harmful admixtures in the air may attain values constituting a danger to the workers' health.

Soviet laws with regard to labor protection limit the degree to which the industrial environment can be polluted by establishing norms of maximum allowable concentrations of toxic gases, vapors, and dust in the air.

7/27

USSR

PEREGUD, Ye. A. and GERNET, Ye. V., Khimiya, 1970, pp 2, 3-8, 9-12, 13-15

The practice of establishing hygienic norms of maximum allowable concentrations of toxic substances requires a systematic control of the industrial air environment, and consequently the availability of sensitive and when possible selective methods of analysis.

The sanitary-chemical analysis of the air is one of the most complex branches of analytical chemistry. Concentrations of toxic substances when determined are expressed in tenths and frequently in 100ths of a milligram per cubic meter of air. In addition, the analyst frequently has to deal not only with individual substance, but also with multicomponent mixtures and highly complex analytical systems.

Through efforts of Soviet chemists during the past four decades a special branch of analytical chemistry known as Industrial-Sanitary Chemistry has been created and is continuing to develop. Its main object of investigation is the air of industrial enterprises.

In the period that has passed general positions with relations to the tasks confronting industrial hygiene in connection with the chemicoanalytical control of the air environment and original methods of detection of large quantities of toxic gases, vapors, and aerosols in the air were developed.

8/27

USSR

PEREGUD, Ye. A. and GERNET, Ye. V., Khimiya, 1970, pp 2, 3-8, 9-12, 13-15

Many of the photometric methods currently used in the different spheres of analytical chemistry -- hydro-chemical, biochemical, and other types of analysis -- had their beginning and subsequent development in the sphere of Industrial-Sanitary Chemistry.

The list of toxic substances for which PDK norms in the air have been established includes a considerable number of substances belonging to different groups of organic compounds: hydrocarbons, complex ethers, alcohols, and organo-chlorine compounds. Therefore, sensitive group methods along with methods of detection of individual substances are presented in the book.

The availability of functional and elementary methods for the micro-analysis of organic compounds broadens analytical potentials and opens ways for their application to new substances being introduced into industry. In this case all the analyst has to do is to determine the precise conditions applicable to the determination of the given concrete substance.

The group method of analysis acquires particular importance when used in a toxicological experiment conducted for the purpose of determining concentra-tions of studied toxic substances in a polluted chamber. Inasmuch as individual substances, as a rule, are being investigated, the search for a selective method becomes unnecessary.

9/27

USSR

PEREGUD, Ye. A. and GERNET, Ye. V., Khimiya, 1970, pp 2, 3-8, 9-12, 13-15

Most of the methods described in the book are based on the application of highly sensitive color reactions and belong to the colorimetric methods. The availability of special handbooks on the theory and practice of photometric analysis makes it unnecessary to dwell on the general regulations, methods, and procedures used in photometric analysis.

For the purpose of the photometry of colored solutions photometers and photocolorimeters of different makes, and standard series of solutions are widely used in the sanitary-chemical analysis of the air environment.

A detailed description of the method used for the preparation of a standard scale necessary for the visual photometry of color and the compilation of a calibration curve used in the application of photocolorimetry is provided in all of the colorimetric methods presented in the book.

The method of sample selection plays an important role in the analysis of the air in industrial premises. Depending on the aggregate condition of the substance, some other methods of its interception from the air are used. New methods of sample selection, modern filtering materials, solid absorbents used in quasi-liquid and in fluidized beds find their reflection in the book.

10/27

USSR

PEREGUD, Ye. A. and GERNET, Ye. V., Khimiya, 1970, pp 2, 3-8, 9-12, 13-15

Because of the great responsibility of the conclusions arrived at on the basis of the results of PDK determination, the authors have given particular attention to the prescribed portion of the method and creation of conditions ensuring the necessary sensitivity of the determination. This has been achieved by the selection of the appropriate reactions, concentration of the studied substance in a small volume of the solution, adjustment of conditions of sample selection in relation to the volume of and rapidity with which the air is being drawn. The sensitivity of the method is expressed in milligrams per cubic meter of air for the purpose of its convenient comparison with the established maximum allowable concentration, while the volume -- in liters (decimeter^3). One liter = 1.000028 decimeter^3 = 1.000028$\cdot10^{-3}$ meter^3. Methods with a sensitivity lower than PDK are not presented in the book.

Along with sensitivity the extent of method selectivity is indicated, and if information is available the substances which interfere with determination are mentioned.

There are no specific, in the strict sense of the word, methods. Substances interfering with the determination of the sought compound may always be present in an industrial atmosphere. Their removal is usually accomplished

11/27

USSR

PEREGUD, Ye. A. and GERNET, Ye. V., Khimiya, 1970, pp 2, 3-8, 9-12, 13-15

in the course of the sample selection process by the use of selective absorption media.

It is necessary to emphasize the fact that the conditions of an industrial atmosphere as those of an analytical system are manifold and require a conscientious and skilled approach to analysis. Certain corrections which should be indicated by the knowledge of the technological process and the experience of the analyst may always be required.

Table of Contents	Page

12/27

- 7 -

USSR

PEREGUD, Ye. A. and GERNET, Ye. V., Khimiya, 1970, pp 2, 3-8, 9-12, 13-15

Isopropybenzene	36
meta-Diisopropylbenzene	37
Toluol	39
Ditolylmethane	40
Xylol	42
Dinile	44
Styrol	46
alpha-methylstyrol	47
Vinyltoluol	48
Divinylbenzene	49
Naphthalene	51
Tetralin	52
Turpentine	54
Cyclopentadiene	55
Dicyclopentadiene	57
Oil spray	58

13/27

USSR

PEREGUD, Ye. A. and GERNET, Ye. V., Khimiya, 1970, pp 2, 3-8, 9-12, 13-15

14/27

USSR

PEREGUD, Ye. A. and GERNET, Ye. V., Khimiya, 1970, pp 2, 3-8, 9-12, 13-15

15/27

USSR

PEREGUD, Ye. A. and GERNET, Ye. V., Khimiya, 1970, pp 2, 3-8, 9-12, 13-15

16/27

USSR

PEREGUD, Ye. A. and GERNET, Ye. V., Khimiya, 1970, pp 2, 3-8, 9-12, 13-15

17/27

USSR

PEREGUD, Ye. A. and GERNET, Ye. V., Khimiya, 1970, pp 2, 3-8, 9-12, 13-15

18/27

USSR

PEREGUD, Ye. A. and GERNET, Ye. V., Khimiya, 1970, pp 2, 3-8, 9-12, 13-15

19/27

USSR

PEREGUD, Ye. A. and GERNET, Ye. V., Khimiya, 1970, pp 2, 3-8, 9-12, 13-15

20/27

USSR

PEREGUD, Ye. A. and GERNET, Ye. V., Khimiya, 1970, pp 2, 3-8, 9-12, 13-15

21/27